

SIMULTANEOUS MULTI-BEAM PLANAR ARRAY IR (PAIR) SPECTROSCOPY

Abstract

An apparatus and method capable of providing spatially multiplexed IR spectral information simultaneously in real-time for multiple samples or multiple spatial areas of one sample using IR absorption phenomena requires no moving parts or Fourier Transform during operation, and self-compensates for background spectra and degradation of component performance over time. IR spectral information and chemical analysis of the samples is determined by using one or more IR sources, sampling accessories for positioning the samples, optically dispersive elements, a focal plane array (FPA) arranged to detect the dispersed light beams, and a processor and display to control the FPA, and display an IR spectrograph. Fiber-optic coupling can be used to allow remote sensing. Portability, reliability, and ruggedness is enhanced due to the no-moving part construction. Applications include determining time-resolved orientation and characteristics of materials, including polymer monolayers. Orthogonal polarizers may be used to determine certain material characteristics.